P-7.3 Illustrate the polarization of light.

Revised Taxonomy Level 2.2 B Illustrate conceptual knowledge
Students did not address this indicator in physical science

It is essential for all students to

- Understand how the polarization of light illustrates that light is composed of transverse, not longitudinal waves
- Understand why light can be polarized
  - A single electron, vibrating horizontally, emits an electromagnetic wave that is vibrating horizontally
  - A single electron, vibrating vertically, emits an electromagnetic wave that is vibrating vertically
  - Light from a source, (candle, the sun, incandescent bulb) is not polarized because it is produced from many electrons, all vibrating in random directions.
  - When light strikes a polarized filter, the light that is transmitted is polarized.
- Understand how polarized glasses work
  - Light that reflects from a non-metallic surface generally vibrates in the same plane as the surface (light reflected from horizontal surfaces generally vibrates in the horizontal plane)
  - Polarized driving glasses have a polarized axis in the vertical direction, so that the reflected rays from the road and other horizontal surfaces are not transmitted through the glasses.
- Understand how polarized light facilitates 3-D viewing

Assessment
The verb exemplify (illustrate) means to find a specific example or illustration of a concept or principle; therefore, the major focus of assessment will be for students to give examples that show they understand how light is polarized, understand the implications of light polarization for our understanding of the nature of light, and how polarization is used in familiar devices. Conceptual knowledge requires that students understand the interrelationships among the basic elements within a larger structure that enable them to function together. In this case, students understand how electromagnetic radiation produced from vibrating electrons results in transverse waves emanating in random directions.